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L7: Entry 22 of 83 File: USPT Mar 10, 1998

DOCUMENT-IDENTIFIER: US 5725780 A
TITLE: Method for using novel high solids polymer compositions as flocculation aids

DEPR:
More particularly, the instant invention can utilize non-aqueous anionic or nonionic flocculant polymer compositions prepared from starting emulsions of water soluble polymers prepared from ethylenically unsaturated monomers including, inter alia, N-vinyl pyrrolidone, N-vinyl formamide, ethoxylated acrylate and methacrylate esters such as hydroxyethyl methacrylate (HEM) and the 5, 10 and 20 mole ethoxylates of HEM, acrylamide, methacrylamide, N,N-dimethylacrylamide, N-i-propyiacrylamide, N-tert-butylacrylamide, acrylic acid, .alpha.-halo acrylic acid, maleic acid or anhydride, itaconic acid, vinyl acetic acid, allyl acetic acid, methacrylic acid, acrylonitrile, vinyl sulfonic acid, allyl sulfonic acid, vinyl phosphonic acid, vinyl acetate, 2-acrylamido-2-methylpropane sulfonic acid (AMPSA), 2-methacrylamido-2-methylpropane sulfonic acid (methAMPSA), styrene sulfonic acid, hydroxyalkyl acrylates, .beta.-carboxyethylacrylic acid, .beta.-sulfoalkyl (meth) acrylates, sulfoalkyl methacrylates, allyloxy-2-hydroxypropane sulfonic acid, and methacrylamido hydroxypropyl sulfonic acid, alone or in combination. Generally, salts of such polymers can also be used.

CLPR:
8. The method of claim 1, wherein said method for flocculating suspended solids is a waste dewatering method.

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L7: Entry 21 of 83 File: USPT Mar 24, 1998

DOCUMENT-IDENTIFIER: US 5732363 A
TITLE: Solidifying material for radioactive wastes, process for solidifying radioactive wastes and solidified product

BSPR:
In recent years, attempts have been made to realize cement solidification and the like treatment of miscellaneous solid wastes, e.g. metals and concrete, discharged from nuclear power plants.

BSPR:
The dispersing agent to be used in the present invention may also be a copolymer of (meth)acrylic acid, maleic acid, itaconic acid, styrene, a vinyl ether or the like with a copolymerizable monomer. Illustrative examples of the copolymerizable monomer include hydroxyethyl (meth)acrylate, N-vinyl pyrrolidone, sodium styrenesulfonate, sodium allylsulfonate, sodium methacrylsulfonate, vinyl acetate, methyl acrylate, ethyl acrylate, butyl acrylate, acrylonitrile, methyl methacrylate, acrylamide, methacrylamide, ethylene, propylene, isobutylene and the like.

BSPV:
(17) a process for solidifying radioactive wastes which comprises putting the following radioactive miscellaneous solid waste (vii) or (viii) in a container, packing the container with a mixture composed of the solidifying material of any one of the aforementioned items (1) to (12), (h) a cure stimulating agent and if necessary water (to be referred to as mixture (A) hereinafter) with vibration as occasion demands, and subsequently effecting aging and solidification thereof at room temperature or with heating:

BSPW:
(vii) miscellaneous solid waste discharged from nuclear power plants, or

BSPW:
(viii) miscellaneous solid waste discharged from spent nuclear fuel reprocessing plants or facilities;

CLPV:
putting a radioactive miscellaneous solid waste selected from the group consisting of (7) miscellaneous solid waste discharged from nuclear power plants and (8) miscellaneous solid waste discharged from spent nuclear fuel reprocessing plants or facilities in a container,

CLPV:
putting a radioactive miscellaneous solid waste selected from the group consisting of (7) miscellaneous solid waste discharged from nuclear power plants and (8) miscellaneous solid waste discharged from spent nuclear fuel reprocessing plants or facilities in a container,

CLPV:
putting a radioactive miscellaneous solid waste selected from the group consisting of (7) miscellaneous solid waste discharged from nuclear power plants and (8) miscellaneous solid waste discharged from spent nuclear fuel reprocessing plants or facilities in a container,

CLPV:
putting a radioactive miscellaneous solid waste selected from the group consisting of (7) miscellaneous solid waste discharged from nuclear power plants and (8) miscellaneous solid waste discharged from spent nuclear fuel reprocessing

and (8) miscellaneous solid waste discharged from spent nuclear fuel reprocessing plants or facilities in a container,

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L7: Entry 52 of 83 File: USPT Apr 19, 1994

DOCUMENT-IDENTIFIER: US 5304707 A
TITLE: Method for solidification and encapsulation using core-shell polymer particles

BSPR:
Processes for solidifying wastes are known in the art. U.S. Pat. No. 4,077,901 discloses a method for encapsulating liquid or finely-divided solid waste by uniformly dispersing the waste in a liquid thermosettable polymer composition and thereafter curing the waste/polymer under thermal and catalytic conditions. U.S. Pat. No. 4,119,560 discloses a method of treating radioactive waste by introducing the waste solution in a hot, inert, liquid carrier, flashing off the volatile solvents, and coalescing the solid waste particles with a polymeric binder which cures at ambient or elevated temperatures. U.S. Pat. No. 4,382,026 describes a process for encapsulating radioactive organic liquids by contact with insoluble, swellable polymer particles and subsequently a curable liquid resin which is cured to a solid state. U.S. Pat. No. 4,530,723 teaches a method of encapsulation of ion exchange resins by mixing with 1) boric acid or nitrate or sulfate salts, 2) a fouling agent and basic accelerator, and 3) cement. Further, U.S. Pat. No. 4,530,783 describes solidification of radioactive wastes using a composition comprising unsaturated polyesters. All of the above methods are greatly limited in the amount of liquid material which can be solidified or encapsulated by a given amount of solidifier or encapsulant (i.e. typically in the range of about 1:1 to about 2:1 parts by weight liquid material to solidifier or encapsulant).

BSPR:
The core component is the product of aqueous emulsion polymerization of one or more monoethylenically unsaturated monomers containing a group of the formula --HC.dbd.C<, wherein at least about 5% or more by weight of said monomers contain a carboxylic acid group. Examples of suitable monoethylenically unsaturated monomer include styrene, vinyl toluene, ethylene, vinyl acetate, vinyl chloride, vinylidene chloride, acrylonitrile, acrylamide, methacrylamide, and various (C.sub.1 -C.sub.20) alkyl or (C.sub.3 -C.sub.20) alkenyl esters of acrylic or methacrylic acid, such as methyl methacrylate, methyl acrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, 2-ethylhexyl acrylate, 2-ethylhexyl methacrylate, benzyl acrylate, benzyl methacrylate, lauryl acrylate, lauryl methacrylate, palmityl acrylate, palmityl methacrylate, stearyl acrylate, stearyl methacrylate and the like. Examples of suitable monomers containing a carboxylic acid group include acrylic acid, methacrylic acid, itaconic acid, aconitic acid, maleic acid, maleic anhydride, fumaric acid, acrotonic acid, acryloxypropionic acid, methacryloxy-propionic acid, acryloxy acetic acid, methacrylic anhydride, methacryloxyacetic acid, monomethyl acid maleate, monomethyl acid itaconate,, monomethyl fumarate and the like.

BSPR:
The core-shell polymers of this invention are useful in solidifying or encapsulating a wide variety of compositions containing a substantially continuous aqueous phase. Preferably the weight ratio of said aqueous phase to the core-shell polymer used according to this invention is about 10:1 or less. The compositions which can be solidified or encapsulated by the core-shell polymers of this invention may contain an all-aqueous medium or a mixture of water with alcohols, ketones or other polar, miscible solvents, provided that the core-shell polymer is not dissolved by any such solvents. These core-shell polymers can be used to solidify liquid waste products such as industrial effluents containing dissolved or suspended contaminants. The core-shell polymers are particularly useful in solidifying slurries of spent ion exchange resins, pigments such as titanium dioxide, and fillers such as clay, talc, calcium

pigments such as titanium dioxide, and fillers such as clay, talc, calcium carbonate and silicon oxide. The core-shell polymers are also useful in accelerating the drying of cement and coating compositions comprising acrylic emulsions, vinyl acrylic emulsions, vinyl acetate emulsions, styrenated acrylic emulsions, styrene-butaciene-acrylonitrile emulsions or styrene emulsions or mixtures thereof. Further, the core-shell polymers can be used to encapsulate aqueous-containing compositions which contain biologically- or chemically-active materials, such as, for example, pesticides, fungicides, and fire retardants. The core-shell polymer particles containing the encapsulated biologically- or chemically-active material can then be used for controlled release of the encapsulated material.

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L7: Entry 76 of 83 File: USPT Aug 9, 1983

US-PAT-NO: 4397748
DOCUMENT-IDENTIFIER: US 4397748 A

TITLE: Treatment of sanitary sewer systems

DATE-ISSUED: August 9, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Argabright; Perry A.	Larkspur	CO	N/A	N/A
Rhudy; John S.	Littleton	CO	N/A	N/A

US-CL-CURRENT: 210/733; 137/13, 210/734

ABSTRACT:

A method of reducing the fluid flow friction loss of fluid waste materials in the conduits of sanitary sewer systems while at the same time maintaining the solid materials in the fluid in a flowable condition by introducing into a sewer system about 1 to about 10,000 ppm of an aqueous solution of a partially hydrolyzed polyacrylamide polymer having a preselected average molecular weight and molecular weight distribution.

9 Claims, 0 Drawing figures Exemplary Claim Number: 1

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L11: Entry 14 of 56 File: USPT Jun 16, 1998

US-PAT-NO: 5767168
DOCUMENT-IDENTIFIER: US 5767168 A

TITLE: Biodegradable and/or compostable polymers made from conjugated dienes such as isoprene and 2,3-dimethyl-1, 3-butadiene

DATE-ISSUED: June 16, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dyer; John Collins	Cincinnati	OH	N/A	N/A
Hird; Bryn	Cincinnati	OH	N/A	N/A
Wong; Pui Kwan	Houston	TX	N/A	N/A

US-CL-CURRENT: 521/149; 521/150, 521/63, 521/64, 604/358, 604/369

ABSTRACT:

Biodegradable and/or compostable polymers are made from isoprene, 2,3-dimethyl-1,3-butadiene or like conjugated dienes and a crosslinking agent having a cleavable linking group such as ethylene glycol dimethacrylate. These polymers can be used to make absorbent foams that are useful in absorbent articles such as diapers, as well as other biodegradable articles such as films, and latexes useful as binders and adhesives.

9 Claims, 5 Drawing figures Exemplary Claim Number: 1
Number of Drawing Sheets: 4

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L7: Entry 77 of 83 File: USPT Dec 2, 1980

DOCUMENT-IDENTIFIER: US 4237004 A
TITLE: Method for treating waste water

BSPR:
A typical marine industry waste water treatment device presently used is described in U.S. Pat. No. 3,638,590. In accordance with such typical prior art devices, the waste water is collected in a first vessel for separation of non-colloidal solid wastes and the separated solid wastes are comminuted to a maximum particle size of about 1/4 inch. The waste water, including the comminuted solid wastes then are tranferred to a second vessel for coagulation by contact with a suitable high molecular weight polyelectrolyte and the coagulated solid wastes are removed from the liquid wastes in a separate device, such as a centrifuge. The liquid wastes then are directed to a third vessel for disinfection by contact with a suitable chemical, such as sodium hypochlorite. The disinfected liquid wastes may be further purified by absorption of the dissolved organics in a fourth vessel by contact with a suitable absorbant, such as activated charcoal. Other, similar marine sanitation units have been developed which utilize the above-described process steps without the need for solids comminution. One such unit is the SANI-SYSTEM 600 TYPE I device manufactured by CLEAR WATER, INC. Subsidiary of La Mere Industries, Inc., Walworth, Wisconsin, described in Form No. 597169-77.

BSPR:
Another object of the present invention is to provide a method for treating waste water wherein a floating solids layer in a chemical treatment vessel acts as a filter to further purify liquid wastes and to aid in separating liquid from solid wastes.

BSPR:
To achieve the full advantage of the present invention, the waste water contacted with the coagulant and, in one embodiment, also with the disinfectant, is conveyed through a static mixer to disperse the coagulant and disinfectant throughout the waste water prior to entering the treatment vessel. The static mixer comprises a vessel containing tortuous travel paths disposed in the waste water conduit on route to the treatment vessel. The static mixer provides sufficient coagulant-disinfectant-waste water contact by creating turbulent flow to form a homogeneous liquid-solids waste water entering the treatment vessel to assure the formation of a continuous spongy mass of coagulated solids across the entire top surface of the central chamber. The spongy mass of solids provides additional filtration of the waste water entering the treatment vessel.

DEPR:
A wide variety of one or more different monomers may be copolymerized or terpolymerized in amounts up to about 20% with acrylic acid or salts thereof. Typical comonomers include acrylamide, methacrylamide, acrylonitrile, the lower alkyl esters of acrylic and methacrylic acids, vinyl methyl ether, methacrylic acid salts, maleic anhydride and salts thereof, isopropanyl acetate, itaconic acid, vinyl acetate, alpha-methyl styrene, styrene, fumaric acid, aconitic acid, citraconic acid, amides of any of the foregoing acids, alkali metal derivatives (e.g. sodium potassium and lithium), alkaline earth metal derivatives (e.g., magnesium, calcium, barium and strontium), and ammonium salts of any of the above monomeric acids or others, the partial alkyl ester amides and salts of various polycarboxylic acids, vinyl toluene, chlorostyrene, vinyl chloride, vinyl formate, ethylene, propylene, isobutylene.

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L7: Entry 79 of 83 File: USPT Dec 26, 1978

DOCUMENT-IDENTIFIER: US 4131563 A
TITLE: Process of preparing substantially solid waste containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage

ABPL:
A process of preparing substantially solid wastes containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, wherein the wastes are mixed with polymerizable mixtures consisting essentially of monovinyl and polyvinyl compounds and polymerization catalysts, and are converted by polymerization into solid blocks.

BSPR:
This invention relates to a process of preparing substantially solid waste containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, the solids being brought into contact with hardening materials and left to harden into solid masses.

BSPR:
It is known that solid waste of this kind, for example precipitation sludges, spent ion exchangers, ashes and incineration residues, metal cuttings, etc., can be stored in containers (Management of low and intermediate level radioactive wastes; Proceedings of a Symposium Aix-en-Provence, 7th-11th Sept. 1970; IAEA, Vienna, 1970), or mixed with cement slurry and then stored embedded in cement. Storage in containers has been found to entail problems in view of corrosion phenomena affecting the containers. Disadvantages of embedding in cement include the large volumes of waste which this involves, the poor setting properties of cement with respect to the wastes to be embedded, and the inadequate extraction behaviour of the wastes embedded in the cement.

BSPR:
The object of the invention is to provide a process which does not have any of the disadvantages of conventional processes and in which radioactive or toxic solid wastes, or solid wastes containing radioactive or toxic substances, can be irreversibly solidified into blocks or the like with relatively high resistance to extraction and washing out. The solid wastes are intended to be able to be solidified with equal effect whether used in dry form or in admixture with water, aqueous solutions or organic liquids or organic solutions. The process is intended to be able to be carried out inexpensively by only briefly trained personnel and without appreciable outlay on plant. It is intended to provide non-pollutive solidification products which can be handled safely and transported safely to a permanent storage site.

BSPR:
The following represent suitable monovinyl compounds: styrene, methyl styrene, acrylic acid, methacrylic acid, acrylonitrile, acrylic acid esters, methacrylic acid esters, vinyl anisole, vinyl naphthalene, methyl acrylate, ethyl acrylate, propyl acrylate, isopropyl acrylate, butyl acrylate, tert.-butyl acrylate, ethyl hexyl acrylate, cyclohexyl acrylate, isobornyl acrylate, benzyl acrylate, phenyl acrylate, alkyl phenyl acrylates, ethoxy methyl acrylate, ethoxy ethyl acrylate, ethoxy propyl acrylate, propoxy methyl acrylate, propoxy ethyl acrylate, propoxy propyl acrylate, ethoxy phenyl acrylate, propyl methacrylate, isopropyl methacrylate, butyl methacrylate, tert.-butyl methacrylate, ethyl hexyl methacrylate, cyclohexyl methacrylate, isobornyl methacrylate, benzyl methacrylate, phenyl methacrylate, alkyl phenyl methacrylate, ethoxy methacrylate, ethoxy ethyl methacrylate, ethoxy propyl methacrylate, propoxy

methyl methacrylate, propoxy ethyl methacrylate, propoxy propyl methacrylate, ethoxy phenyl methacrylate, ethoxy benzyl methacrylate, vinyl toluene, vinyl chloride, vinyl acetate and vinylidene chloride. Polyethylenically unsaturated monomers such as isoprene, butadiene and chloroprene can also be used.

BSPR:
Toxic wastes include compounds of cadmium and arsenic, cyanides, chromium compounds, mercury and its salts, tin and antimony compounds, thallium compounds, solid wastes with plant protection agents, insecticides, fungicides, stomach poisons and the like. It is possible to solidify both dry wastes and also wastes in admixture with water or aqueous and organic liquids or organic solutions.

BSPR:
The solid wastes are preferably used in quantities of from 2% to 75% by weight and more preferably in quantities of from 30% to 70% by weight, based on the total weight of the wastes + polymerisation mixture. The monovinyl compounds are preferably used in quantities of from 70% to 99.5% by weight and more preferably in quantities of from 85% to 99% by weight, based on the weight of the monomers. The polyvinyl compounds are preferably used in quantities of from 0.5% to 30% by weight and more preferably in quantities of from 1% to 15% by weight based on the weight of the monomers. The polymerisation catalysts are preferably used in quantities of from 0.1% to 6% by weight and more preferably in quantities of from 0.3% to 4% by weight, based on the weight of the monomers.

BSPR:
Emulsifiers and/or swellable or absorbent solids are adventageously added to solid wastes containing water or aqueous solutions before they are mixed with the polymerisation mixture (monomer mixture).

BSPR:
Absorbents are advantageously added to the solid wastes in admixture with organic liquids or organic solutions before they are mixed with the polymerisation mixture. Vermiculite or macroporous styrene-divinylbenzene copolymers are used as absorbents.

BSPR:
In the process according to the invention there can be used as solid wastes also swellable or absorbent solids which have been impregnated with radio active or toxic liquids. In this manner also radio active or toxic liquids can be worked up according to the invention.

BSPR:
In cases where moist solids are used, it is advantageous slightly to increase the proportion of monomer so that the soldid wastes are present in an amount of 30% to 60% by weight based on the total weight of solid wastes + polymerisation mixture.

BSPR:
The process according to the invention is generally carried out by adding the solid waste preferably without stirring in portions to a polymerisation mixture of the monovinyl compound, the polyvinyl compound and the polymerisation catalyst and keeping the mixture without external heating. By the energy evolved by the polymerisation the temperature of the mixture raises to about 30 to 70.degree. C. After the heat effect has disappeared, the material is hard and the radioactive or toxic solid is included in the polymer. The mixtures to be polymerised generally harden after 2 to 20 days to from a solid block. They may be left with advantage in the polymerisation can be carried principally at temperatures from 15 to 150.degree. C.

CLPR:
1. In the process of preparing substantially solid wastes containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, by bringing the solid wastes into contact with hardening materials and hardening the same into solid masses, the improvement wherein the solid wastes are mixed with polymerizable mixtures consisting essentially of styrene selected from the group consisting of divinyl benzene and trivinyl benzene, and polymerization catalysts, and the resulting mixtures are converted by polymerization into solid blocks, the solid wastes being used in quantities of from 2% to 75% by weight, based on the total weight of the wastes +

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L11: Entry 53 of 56 File: USPT Dec 26, 1978

DOCUMENT-IDENTIFIER: US 4131563 A
TITLE: Process of preparing substantially solid waste containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage

ABPL:
A process of preparing substantially solid wastes containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, wherein the wastes are mixed with polymerizable mixtures consisting essentially of monovinyl and polyvinyl compounds and polymerization catalysts, and are converted by polymerization into solid blocks.

BSPR:
This invention relates to a process of preparing substantially solid waste containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, the solids being brought into contact with hardening materials and left to harden into solid masses.

BSPR:
It is known that solid waste of this kind, for example precipitation sludges, spent ion exchangers, ashes and incineration residues, metal cuttings, etc., can be stored in containers (Management of low and intermediate level radioactive wastes; Proceedings of a Symposium Aix-en-Provence, 7th-11th Sept. 1970; IAEA, Vienna, 1970), or mixed with cement slurry and then stored embedded in cement. Storage in containers has been found to entail problems in view of corrosion phenomena affecting the containers. Disadvantages of embedding in cement include the large volumes of waste which this involves, the poor setting properties of cement with respect to the wastes to be embedded, and the inadequate extraction behaviour of the wastes embedded in the cement.

BSPR:
The object of the invention is to provide a process which does not have any of the disadvantages of conventional processes and in which radioactive or toxic solid wastes, or solid wastes containing radioactive or toxic substances, can be irreversibly solidified into blocks or the like with relatively high resistance to extraction and washing out. The solid wastes are intended to be able to be solidified with equal effect whether used in dry form or in admixture with water, aqueous solutions or organic liquids or organic solutions. The process is intended to be able to be carried out inexpensively by only briefly trained personnel and without appreciable outlay on plant. It is intended to provide non-pollutive solidification products which can be handled safely and transported safely to a permanent storage site.

BSPR:
The following represent suitable monovinyl compounds: styrene, methyl styrene, acrylic acid, methacrylic acid, acrylonitrile, acrylic acid esters, methacrylic acid esters, vinyl anisole, vinyl naphthalene, methyl acrylate, ethyl acrylate, propyl acrylate, isopropyl acrylate, butyl acrylate, tert.-butyl acrylate, ethyl hexyl acrylate, cyclohexyl acrylate, isobornyl acrylate, benzyl acrylate, phenyl acrylate, alkyl phenyl acrylates, ethoxy methyl acrylate, ethoxy ethyl acrylate, ethoxy propyl acrylate, propoxy methyl acrylate, propoxy ethyl acrylate, propoxy propyl acrylate, ethoxy phenyl acrylate, propyl methacrylate, isopropyl methacrylate, butyl methacrylate, tert.-butyl methacrylate, ethyl hexyl methacrylate, cyclohexyl methacrylate, isobornyl methacrylate, benzyl methacrylate, phenyl methacrylate, alkyl phenyl methacrylate, ethoxy methacrylate, ethoxy ethyl methacrylate, ethoxy propyl methacrylate, propoxy

methyl methacrylate, propoxy ethyl methacrylate, propoxy propyl methacrylate, ethoxy phenyl methacrylate, ethoxy benzyl methacrylate, vinyl toluene, vinyl chloride, vinyl acetate and vinylidene chloride. Polyethylenically unsaturated monomers such as isoprene, butadiene and chloroprene can also be used.

BSPR:
Toxic wastes include compounds of cadmium and arsenic, cyanides, chromium compounds, mercury and its salts, tin and antimony compounds, thallium compounds, solid wastes with plant protection agents, insecticides, fungicides, stomach poisons and the like. It is possible to solidify both dry wastes and also wastes in admixture with water or aqueous and organic liquids or organic solutions.

BSPR:
The solid wastes are preferably used in quantities of from 2% to 75% by weight and more preferably in quantities of from 30% to 70% by weight, based on the total weight of the wastes + polymerisation mixture. The monovinyl compounds are preferably used in quantities of from 70% to 99.5% by weight and more preferably in quantities of from 85% to 99% by weight, based on the weight of the monomers. The polyvinyl compounds are preferably used in quantities of from 0.5% to 30% by weight and more preferably in quantities of from 1% to 15% by weight based on the weight of the monomers. The polymerisation catalysts are preferably used in quantities of from 0.1% to 6% by weight and more preferably in quantities of from 0.3% to 4% by weight, based on the weight of the monomers.

BSPR:
Emulsifiers and/or swellable or absorbent solids are adventageously added to solid wastes containing water or aqueous solutions before they are mixed with the polymerisation mixture (monomer mixture).

BSPR:
Absorbents are advantageously added to the solid wastes in admixture with organic liquids or organic solutions before they are mixed with the polymerisation mixture. Vermiculite or macroporous styrene-divinylbenzene copolymers are used as absorbents.

BSPR:
In the process according to the invention there can be used as solid wastes also swellable or absorbent solids which have been impregnated with radio active or toxic liquids. In this manner also radio active or toxic liquids can be worked up according to the invention.

BSPR:
In cases where moist solids are used, it is advantageous slightly to increase the proportion of monomer so that the soldid wastes are present in an amount of 30% to 60% by weight based on the total weight of solid wastes + polymerisation mixture.

BSPR:
The process according to the invention is generally carried out by adding the solid waste preferably without stirring in portions to a polymerisation mixture of the monovinyl compound, the polyvinyl compound and the polymerisation catalyst and keeping the mixture without external heating. By the energy evolved by the polymerisation the temperature of the mixture raises to about 30 to 70.degree. C. After the heat effect has disappeared, the material is hard and the radioactive or toxic solid is included in the polymer. The mixtures to be polymerised generally harden after 2 to 20 days to from a solid block. They may be left with advantage in the polymerisation can be carried principally at temperatures from 15 to 150.degree. C.

CLPR:
1. In the process of preparing substantially solid wastes containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, by bringing the solid wastes into contact with hardening materials and hardening the same into solid masses, the improvement wherein the solid wastes are mixed with polymerizable mixtures consisting essentially of styrene selected from the group consisting of divinyl benzene and trivinyl benzene, and polymerization catalysts, and the resulting mixtures are converted by polymerization into solid blocks, the solid wastes being used in quantities of from 2% to 75% by weight, based on the total weight of the wastes +

polymerization mixture, the styrene being used in quantities of from 70% to 99.5% by weight, based on the weight of the monomers, the polyvinyl compounds being used in quantities of from 1.0% to 30% by weight, based on the weight of monomers, and the polymerization catalysts being used in quantities of from 0.1% to 6% by weight, based on the weight of the monomers.

CLPR:
2. The process as claimed in claim 1 wherein solid wastes of the kind accumulating in nuclear engineering are included.

CLPR:
4. The process as claimed in claim 1 wherein solid wastes are used in quantities of from 30% to 70% by weight, based on the total weight of the wastes + polymerization mixture, the styrene is used in quantities of from 85% to 99% by weight, based on the weight of the monomers, the polyvinyl compounds are used in quantities of from 1% to 15% by weight, based on the weight of the monomers, and the polymerization catalysts are used in quantities of from 0.3 to 4% by weight, based on the weight of the monomers.

CLPR:
5. The process as claimed in claim 1 wherein emulsifiers are added to solid wastes containing water or aqueous solutions before they are mixed with the polymerizature mixtures.

CLPR:
6. The process as claimed in claim 1 wherein swellable or absorbent solids are added to solid wastes containing water or aqueous solutions before they are mixed with the polymerizable mixtures.

CLPR:
9. The process as claimed in claim 1 wherein absorbents are added to solid wastes containing organic liquids or organic solutions before they are mixed with the polymerizable mixture.

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